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Prevalence of oral lesions in HIV infected adult population of Mangalore, Karnataka, India

Mithra N. Hegde[1*], Nidarsh D. Hegde[2], Amit Malhotra[1]

[1] Department of Conservative Dentistry and Endodontics, A. B. Shetty Memorial Institute of Dental Sciences, NITTE University, Derelakatte, Mangalore, India
[2] Department of Oral and Maxillofacial Surgery, A. B. Shetty Memorial Institute of Dental Sciences, NITTE University, Derelakatte, Mangalore, India

Abstract

The aim of this study was to find the prevalence of oral lesions in human immunodeficiency virus (HIV) positive patients and investigate if there was a relationship between oral manifestations and the level of immunosuppression. 125 patients infected with HIV in the age group of 20-40 years were examined for the presence of different oral lesions according to the EEC criterion. The CD4 count, as well as any therapy being instituted was recorded and correlated with the oral manifestations seen. Comparison of common oral lesions present to absent was done by chi square test using linear by linear association. The prevalence of oral lesions among the investigated HIV patients was found to be 71%, with periodontitis – 52% and erythematous candidiasis – 48% being the most prevalent oral lesions; as well, periodontitis and oral hairy leukoplakia were found to be significantly associated with the immunosuppression in the disease. Thus, oral lesions have been found to be associated with the early manifestation of HIV and a measure of disease severity.

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*Corresponding Author: Mithra Hegde, e-mail: drhegdedentist@gmail.com

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Introduction

Human immunodeficiency virus (HIV) disease affects the entire body. Any health personnel dealing with diagnosis and treatment in humans is at risk to get infected with this dreaded disease if proper preventive guidelines are not followed. Thus it becomes imperative to be aware of the various forms of HIV manifestations.

Oral health is an important component of the overall health status in HIV infection. Awareness of the variety of oral disorders which can develop throughout the course of HIV infection and coordination of health care services between a physician and a dentist may improve the overall health of the patient. The HIV infection progresses to acquired immunodeficiency syndrome AIDS [1].

AIDS epidemic is increasing all over the world without any definite treatment. Antiretroviral medications can only control the progression rate of disease [2-4]. Oral manifestations of HIV infection are important in the AIDS epidemic and some of them could be used to assess the status of immune-suppression and determine the prognosis of the disease [5]. Some oral lesions may even

affect patient's quality of life [6]. Early diagnosis and appropriate treatment of oral lesions have great influence on patients' general health and can reduce the mortality rate of the disease [7]. Reduction of circulating CD4 count is the main criteria for assessing the immunosuppression status in HIV-positive patients. The normal number of circulating CD4 cells ranges from 600 to 1600 cells/ mm^3, but the initial signs of immunosuppression occur when CD4 count is lower than 500 cells/mm^3. WHO proposed the immunological classification on the basis of CD4 count as none or not significant – Group 1 (>500/ ml), mild – Group 2 (350-499/ml), advanced – Group 3 (200-349/ml) and severe – Group 4 (<200/ml). Studying the prevalence of AIDS-related oral lesions in different regions of the world is important as it provides a more thorough description of the epidemic and scientific basis for the appropriate management of the disease by health care workers [8]. Although some lesions such as candidiasis and hairy leukoplakia are considered as prognostic factor of HIV disease, recent data have indicated that concurrent existence of multiple and variable oral lesions is accompanied with poor prognosis of the disease [9].

Santos et al. reported that oral lesions were common among HIV positive children and the most common lesion was pseudomembranous candidiasis. Most of the patients with oral candidiasis were suffering from severe immunosuppression, and they concluded that candidiasis and gingivitis could be considered as an indicator of the disease progression [4]. The research work conducted by Sud et al. and Nokta have also shown an association between low CD4 counts and candidiasis, linear gingival erythema, angular cheilitis, scabies, paronychia, oral pigmentation, diffuse hair loss and other oral symptoms [7, 8].

Since the oral manifestations of HIV infection are common and can be considered as indicators of immunosuppression, the aim of this survey was to investigate if there was a relationship between oral manifestations and the level of immunosuppression in HIV-positive patients. The results might be used as a guide in determining the immunosuppression level of HIV disease according to oral manifestations.

Materials and Methods

A cross-sectional study was carried out among 125 proven HIV-positive patients showing positive ELISA and Western blot test, selected randomly from the ART centre, Wenlock Hospital, Mangalore, India. Ethical clearance was obtained from the Institutional Ethical Committee of A.B. Shetty Dental College, Nitte University. Patients were informed about the objective of the study and signed an informed consent form before oral examination.

Data including sexual habits, IV drug abuse, hemophilia, blood transfusion, addiction, other diseases, previous CD4 counts, and opportunistic systemic infections were extracted from the patient records. All patients received oral hygiene instructions. CD4 counts were determined using complete blood count and flow cytometry.

A questionnaire was completed for each patient regarding past medical history, systemic signs and symptoms, and oral manifestations. Patients were examined by an infectious disease specialist prior to dental examination. Oral cavity was inspected carefully. Intra-oral examination was performed on a dental unit using disposable dental mirrors and sterile gauze pads under appropriate lighting. Submandibular, submental and cervical lymph nodes were palpated bidigitally by the examiner. Further clinical examination using an explorer and probing with a periodontal probe were done in order to diagnose periodontal diseases. All patients were examined by similar instruments, under the same circumstances and at the same place by the single specialist to avoid the inter-examiner bias.

The oral lesions were diagnosed according to the criteria established by the EC Clearinghouse and WHO (EC Clearinghouse,1993), as follows:

Oral candidiasis

Shiny erythematous areas of mucosa, sometimes with white patches interspersed. The four clinical subtypes are characterized as:

(1) Erythematous type: red area without removable white spots or plaques.
(2) Pseudomembranous type: white removable spots or plaques.
(3) Hyperplastic type: firm, adherent, unscrapable white plaques.
(4) Angular cheilitis: fiery red commissures with a fissuring or cracking appearance.

Oral hairy leukoplakia (OHL)

Non-scrapable, corrugated white plaques that did not respond to anti-fungal therapy. These were always on the lateral borders of the tongue.

Gingivitis

Distinctive dusky red, cyanosed free gingiva, presence of bleeding on probing and/or spontaneous bleeding.

HIV-gingivitis (Linear gingival erythema)

Gingiva which presents an unusual clinical appearance, such as fiery red band along the margin of the gingiva, with or without focal enlargement of the gingiva in an otherwise healthy oral cavity. No ulceration present, nor pockets or loss of attachment.

Periodontitis

Presence of pockets >4 mm in one or more sites. All teeth present were probed around the whole circumference with a blunt periodontal probe, with William's markings.

Oral (melanin) pigmentation

Brown/brownish-black, spotty/diffuse macules, usually occupy areas greater than 1 cm and asymmetrical in distribution. The level of immunosuppression in each patient was classified according to WHO immunologic staging (Table 1).

Table 1. WHO immunological classification system.

HIV – associated immunodeficiency	CD4 count (cells/mm^3)
None or not significant	>500
Mild	350-499
Advanced	200-349
Severe	<200

Data collection and statistical analysis:

The data was recorded and the presence of each lesion was noted, the information collected was then divided into four groups on the basis of immunological classification of WHO. This was a cross-sectional study and point prevalence of each lesion was calculated. Since the nature of data congregated was categorical, chi square test was used to find the relationship between the four groups. After obtaining chi square test value, p value was ascertained and the value of <0.05 was interpreted as significant.

Results

125 patients (mean age, 32 ± 7.7 years old; 52% males) were investigated. The mean duration of infection was 5.4 ± 3.2 years. Medical history indicated taking anti-tuberculosis medication (25%) and constant use of antibiotics (40%), anti-fungal therapy (4%) and highly active antiretroviral therapy (HAART, 44%).

Absolute CD4 counts were categorized in four different groups: Group I (>500 cells/mm^3), Group II (350-499 cells/mm^3), Group III (200-349 cells/mm^3) and Group IV (0-200 cells/mm^3). Out of the 125 cases studied, it was observed that 60 patients (52%) of the cases exhibited periodontal disease which was highest prevalence of the oral lesions followed by erythematous candidiasis (48%). The pseudomembranous form of candidiasis was seen in 12% of the cases (Table 2).

As the immunosuppression worsened the oral manifestations increased (Table 3). In groups 1-3 the most prevalent manifestation was erythematous candidiasis (chi square - 24. 528 and $p < 0.001$) whereas the trend shifted to periodontal disease in group 4 (chi square - 38.624 $p < 0.001$) (Table 4). 19 cases of oral hairy leukoplakia were reported, out of which 11 were found in the severely immunosuppressed Group IV (Table 3).

89 out of total 125 cases showed the presence of lesion, one lesion was observed in 23 patients, 2 in 19,

Table 2. Prevalence of Oral lesions in HIV positive patients.

Prevalence of Oral Lesion	n	Percentage (%)
Erythematous candidiasis	60	48.0
Hyperpigmentation	41	32.8
Oral hairy leukoplakia	19	15.2
Linear gingival erythema	21	16.8
Periodontal disease	65	52.0
Angular chelitis	16	12.8
Pesudomembranous candidiasis	15	12.0

Table 3. Prevalence of intraoral lesions in different groups of HIV- WHO Classification of immunosuppression.

Lesion	n	Not significant >500 CD4 count	Mild 351-500 CD4 count	Advanced 200-349 CD4 count	Severe <200 CD4 count
Erythematous candidiasis	60	05	09	16	30
Hyperpigmentation	41	04	08	11	18
Oral hairy leukoplakia	19	01	03	05	11
Linear gingival erythema	21	02	04	06	09
Periodontal disease	65	03	07	15	40
Angular chelitis	16	01	04	06	05
Pseudomembranous candidiasis	15	01	03	05	06

Table 4. Chi square test performed to find relation between intraoral lesions and increase in immunosuppression in HIV positive population.

Lesion	Chi square test	P value
Erythematous Candidiasis	24.528	<0.001
Hyperpigmentation	17.949	<0.001
Oral hairy leukoplakia	14.347	<0.001
Linear gingival erythema	13.323	<0.001
Periodontal disease	38.624	<0.001
Angular chelitis	7.162	0.007
Pseudomembranous candidiasis	10.254	0.001

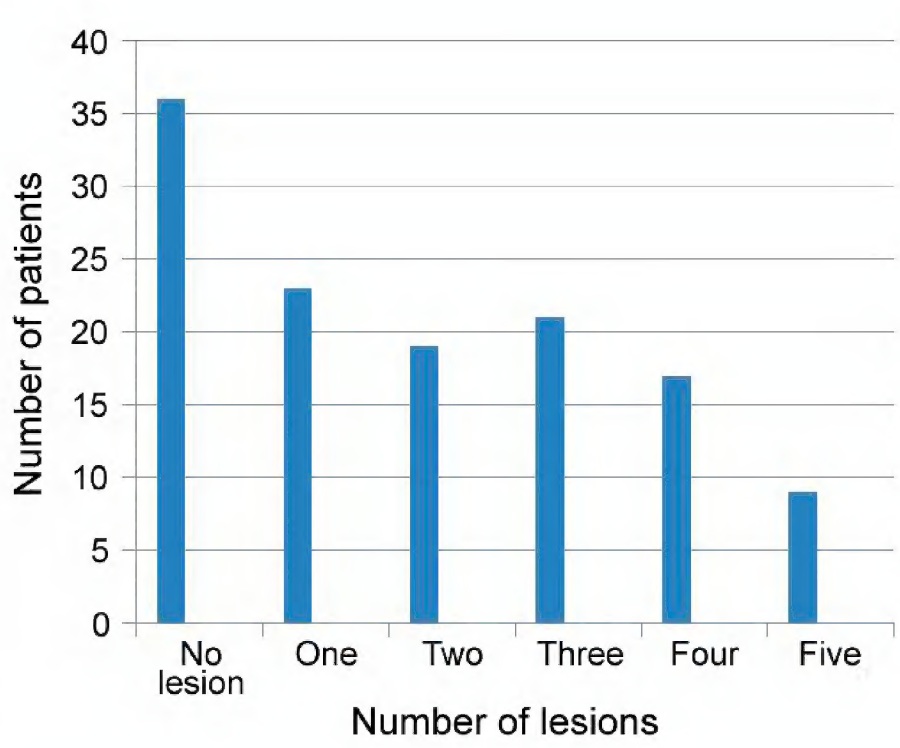

Figure 1. Number of patients with multiple lesions.

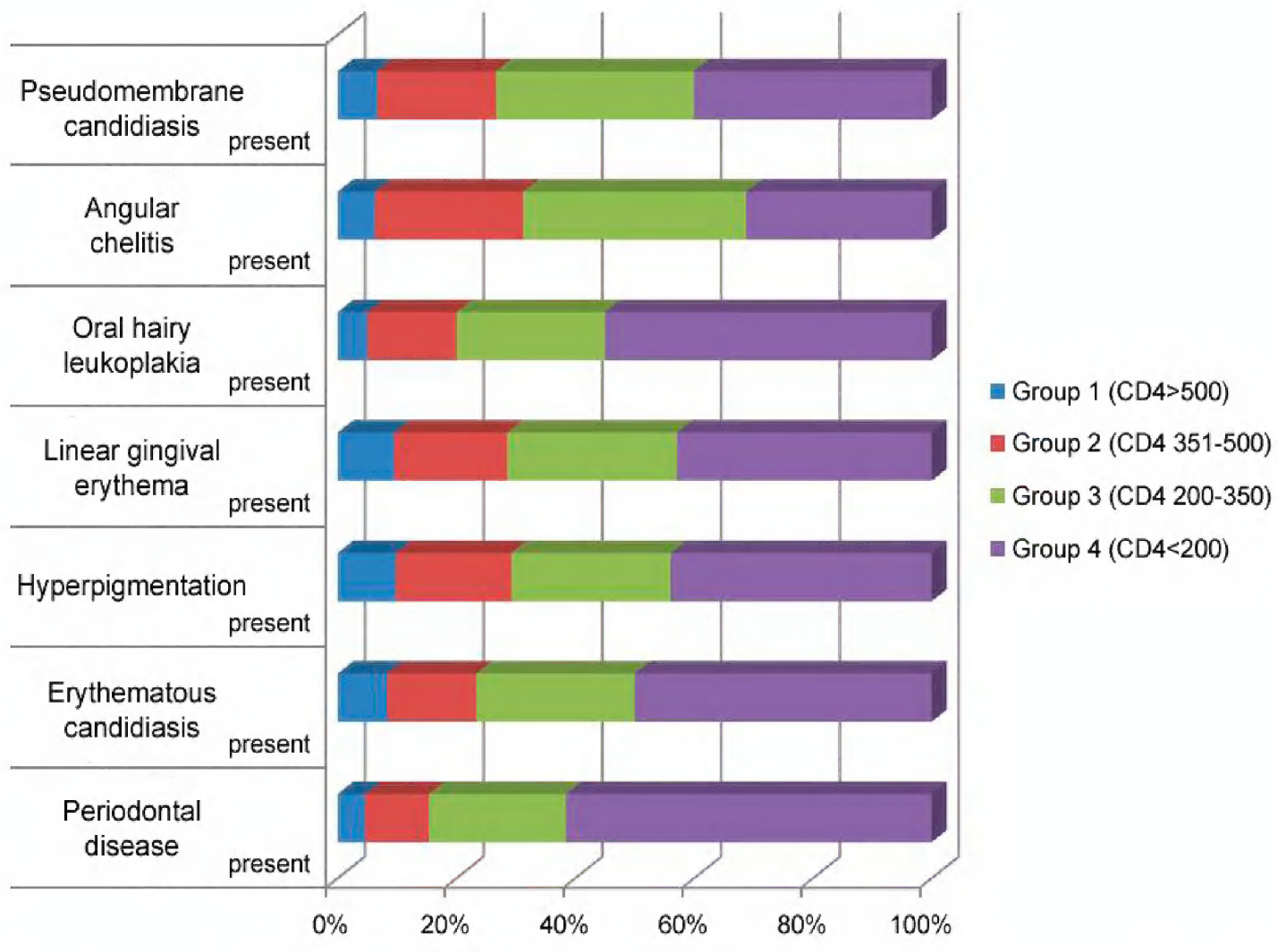

Figure 2. Oral lesions increase with the increase of immunosuppression (decrease of CD4 count).

3 lesions in 21 cases, 4 in 17 patients and 5 lesions in 9 cases (Figure 1).

There was an evident increase in number of lesion and decreased average CD4 count with increased level of immunosuppression (Figure 2).

Discussion

Various studies have noted different prevalence of oral lesions due to variable sample size, degree of immunosuppression, inter-examiner differences, and regional patterns of infectious diseases. Therefore, extrapolating the results comparing the reported prevalence of existing studies may not be useful.

This study had almost equal gender distribution with 52% males which is in contrast to the studies done by Sharma et al. (13], Nittayananta et al. [17] ,Ranganathan et al. [16] where males were predominant.

The study was done in the age group of 20-40 years as this age range shows the peak distribution of people affected with HIV.

The present study noted an overall prevalence of oral lesions of 71% in the HIV infected population of Dakshina Kannada regardless of the severity of the disease which is lower when compared to previous studies done by Sharma et al. [13], and Ranganathan [18]. This may be due to the fact that in the current study higher number of patients was on highly active antiretroviral therapy (HAART).

Periodontal disease showed the highest prevalence (52%), which was not noted in the previous studies; this may be a result of poor oral hygiene, drugs, medications. Periodontitis showed highly significant relationship with the increase in immunosuppression.

Oral candidiasis was the common finding with Erythematous candidiasis showing prevalence in 48% of the patients which is in agreement with a previous study done in the same region by Sharma and colleagues [12].

The prevalence of oral lesions viz. hyperpigmentation (32.8%), linear gingival erythema (16.8%), hairy leukoplakia (15.2%), angular cheilitis (12.8%), and pseudomembranous candidiasis (12%) was found to be consistent with the previous studies [12-14].

With new research studies, the treatment modalities instituted have increased the lifespan of people infected with HIV. Yengopal et al. in 2007 found that Oral lesions associated with HIV infection negatively affect the oral health–related quality of life in infected patients [15]. Thus, the dentist has an important role to play along with the medicine specialist in monitoring the progression of the disease.

A significant relation was found between oral lesions and the degree of immunosuppression (p value<0.001). The number of lesions increased with increased degree of immunosuppression as has been pointed out by the study done by Sharma et al. [12]. The oral lesions were studied according to the immunosuppression staging done by WHO in 2007 so that the preventive measures instituted for the oral health can be correlated to the WHO treatment guidelines in different stages of infection. This may also have implications on diagnosis and prognosis of the disease [10].

The periodontal disease and oral hairy leukoplakia increased sharply in the severely immunosuppressed stage of HIV disease and can be useful in predicting the progression of the disease.

Even though, there is an increase in awareness, prevention and extensive treatment strategies due to the programmes carried out by WHO in developing countries, the decrease in oral lesions is not significant hence studies testing the methods of improving oral hygiene and in turn oral health needs to be carried out.

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